

The Rise, the Fall, and the Emerging Recovery of Project Finance in Transport

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Many transport projects undertaken during the boom period of the 1990s came to a crashing halt in 1997, and conditions in emerging markets worsened in 1998 and 1999. Many projects failed, victim of everything from overoptimistic forecasts to excessive debt to an inability to refinance bridge loans. As available financing dried up, many projects went bankrupt, had to be renegotiated, or were taken over by the government. What have we learned from all this?



Summary findings

Recent developments in emerging financial markets have dramatically changed the appetite for (and terms of) transport infrastructure projects. As a result of defaults in Asia and Russia and devaluations in Asia, Brazil, and Russia, political and currency and exchange risk premia have increased dramatically. Given large needs for sovereign debt financing, infrastructure project finance will be seeking guarantees at the same time as governments are issuing primary securities. Large portfolio outflows in emerging market funds mean that the sources of both equity and debt capital that became available in the mid-1990s are drying up for all but the most creditworthy projects.

Moreover, real economic effects from financial events have consequences in the transport sector, since transport is a derived demand. Any decline in real economic activity is felt quickly in traffic levels and revenues. Currency devaluations that help spur exports may generate higher volumes for seaports and air cargo activity. These effects vary by sector, especially over the

medium to longer term. Declines in real economic activity make matters especially difficult for toll roads, as drivers shift to free alternatives and reduce the number of trips taken.

What does all this mean for project finance in transport? Risks have increased. Debt finance costs more. The available tenor of debt instruments has shortened and more equity is required for projects. The sources and availability of equity finance have changed. Project finance efforts have shifted from new projects to the privatization, rehabilitation, and expansion of existing facilities. And a "superclass" of sponsors, bankers, and investors has emerged.

Failures and mistakes in project finance deals in the 1990s were sharp and persistent. But much has been learned about sound project economics, conservative financial structures, comprehensive sensitivity analysis, the effects of macroeconomic factors, and the need for proper incentives and sound institutional and regulatory arrangements.

This paper—a product of Governance, Regulation, and Finance, World Bank Institute—is part of a larger effort in the institute to increase understanding of infrastructure regulation. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Gabriela Chenet-Smith, room J3-147, telephone 202-473-6370, fax 202-676-9874, email address gchenet@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. The authors may be contacted at aestache@worldbank.org or jstrong@worldbank.org. July 2000. (31 pages)

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We benefited from comments, suggestions and discussions on these issues with Mauricio Gutierrez, Ellis Juan, Jorge Kogan, Carlos Trujillo and many participants to the various courses on transport regulation we have been affiliated with.

Introduction

The financial crises in emerging markets in the 1990s dramatically changed the market for transport infrastructure finance. The run of good economic and financial performance, whether actual or illusory, had spurred a boom in project finance activity. As one observer noted in November 1996 (just before the Asian crises occurred), "...there is a growing acceptance of investing in (developing) countries because they have done very positive things to make themselves more attractive...another theory is that there's fundamentally too much money out there, and the money is chasing around after deals and some people are fooling themselves."¹ As new sources of money, from pension assets to emerging bond markets to new types of bank debt, became available, many infrastructure projects were able to obtain financing.

This boom period led to two basic problems. First, forecasts of revenues, traffic, and economic activity became more and more optimistic, so that "best case" scenarios often became "base case" scenarios, and little attention was paid to "worst case" scenarios. Second, this lack of attention to project evaluation led to a willingness to use ever-larger amounts of debt in project capital structures. Even high-risk projects faced heavy debt servicing burdens. Long-term projects were undertaken using short-term debt, buoyed by confidence that when the debt matured, it would simply be "rolled over" on equivalent (or better) terms. Floating-rate debt was common, further increasing interest rate risk. Projects that generated local currency revenues were increasingly being financed in international markets, as lenders and borrowers grew confident that exchange rates would remain the same, so that currency risk was minor.

At the same time, new types of financial instruments were developed and being used without a clear understanding of the risks they imposed, especially on behalf of governments. As an example, the growth of securitization (the pooling of project finance securities) was interpreted by some government officials as a means of avoiding sound economic and credit analysis of projects.² This new type of transaction was sometimes interpreted as a means to pass along poor projects: "After all, even if this one project was pretty risky, it would just become one part of a larger portfolio—and so there was no need to worry."

This project finance environment came to a crashing halt in 1997, and was worsened by conditions in emerging markets in 1998 and 1999. Again, there were two main results. First, many of the projects that had been undertaken in the previous few years failed. They fell victim to everything ranging from optimistic forecasts to too much debt to an inability to refinance bridge loans. Many projects were hit with a cascade of problems because currency depreciations led to high inflation and economic contractions that sharply reduced revenues. Project revenues were further reduced through price effects of contractually mandated toll increases (due to inflation). The same inflation resulted in higher financing costs, in some cases doubling debt service burdens within weeks. Currency depreciations made it almost impossible for many projects to generate enough foreign exchange to meet international debt payments. To

¹ John Wand, Managing Director of Project Finance at Prudential Capital, quoted in G. Millman, "Negotiating the Project Finance Labyrinth," *Infrastructure Finance*, November 1996, p. 15.

² For a more complete discussion of securitization as applied to project finance, see J. P. Forrester, J. H. P. Kravitt, and R. M. Rosenberg, "Securitization of Project Finance Loans and Other Private Sector Infrastructure Loans," *The Financier*, Vol. 1 No. 1, (February 1994), pp. 7-19.

paraphrase an old advertising campaign, for transport project finance in developing countries it was a time of “when it rains, it pours.”

The results were dramatic. Foreign investment flows to emerging markets in 1999 were less than half of what they had been five years earlier. A whole range of projects, from toll roads to ports to airports, either went bankrupt, had to be renegotiated, or were taken over by the respective governments. As available financing dried up, projects that had been in the proposal or development stages were unable to come to market and close. Regulators and governments worldwide found they had to develop new skills in contract renegotiations and workouts. Many countries are still struggling with the financial consequences of failed project finance structures.

Many of the long-established features of project finance have come under attack or have been modified so that old definitions and approaches have given way to new roles for governments and development institutions. At the same time, the private sector has had to adjust to new demands from investors in terms of financial structures, required returns, and risk allocation and mitigation. This chapter provides a primer on this new world of project finance for government officials and transport regulators.

The Rise of Private Participation in Transport

The rise of project finance in transport has its roots in broader privatization initiatives. Worldwide, recent years have seen a dramatic increase in the involvement of the private sector in the development and funding of public facilities and services in transport, ranging from management contracts for existing operations to full greenfield development of new infrastructure.³

The development of such private participation in transport operations and infrastructure is attributable to a number of factors. First, national governments have increasingly found that they do not have the financial resources to upgrade, maintain, and expand transport infrastructure consistent with economic growth and development goals. Additionally, private participation is seen as a means to bring infrastructure projects and technological efficiencies that may be difficult to match in the public sector. A government can facilitate the project through the provision of assets, such as land and licenses, and possibly through the provision of subsidies, guarantees, or other support.

There are many forms of private participation in transport, including:

- *The contracting out of services*, where the private sector is contracted to provide services on behalf of the government for compensation, either in terms of a share of revenue, profit, or payments from the government. In general, contracting out does not involve financing risk, although it may involve revenue risk.
- *Joint ventures*, in which the public and private sectors share responsibility for financing and operation of public facilities;

³ See J. A. Gomez-Ibanez and J. R. Meyer, *Going Private: The International Experience with Transport Privatization*, (Washington: Brookings, 1993); A. Estache, “Privatization and Regulation of Transport Infrastructure in the 1990s,” World Bank Policy Research Paper 2248, (Washington: World Bank, November 1999).

- *Build, Operate, Transfer (BOT) projects*, where the private sector has the primary responsibility for financing, developing, and operating the facility for a fixed period of time, which should be sufficient to both repay debt and provide the required return on investment. At the end of the concession, assets are transferred to the government under terms agreed to in the contract. Perhaps the most familiar form of participation in transport infrastructure, this has been employed in many different variations.⁴
- *Build, Own, and Operate (BOO)*, where the private sector obtains the ownership and control of the facilities, with no transfer to the public sector.

Within these broad categories is a continuum of organizational forms for private participation in which the risk level taken on by the private sector increases until it gets fully assumed. Project finance and regulatory issues arise generally from the organizational forms organized around concessions, franchises, and variations of Build-Operate-Transfer (BOT) projects with or without concessions.

What is Project Finance?

Project finance has typically been used in those sectors that require large capital expenditures, that have long-lived assets, and that require long periods to amortize investment costs and generate required rates of return for both creditors and equity holders. Historically, project finance has been used to describe financings in which the lenders look to the cash flows of an investment project for repayment, without recourse to either equity sponsors or the public sector to make up any shortfall.

In its simplest terms, project finance usually has the following features which are built around the contractual commitments to each other:⁵

- A special purpose vehicle is created to undertake the project; the idea is to isolate as much as possible the project from other activities in which the various players may be involved to force the transparency of the financing commitments made to the project; More specially, the project itself is treated as a separate entity from the sponsors, and this entity borrows funds solely based on the project's cash flows and the equity in the entity itself. This independence allows the project to be separated from the equity investors' balance sheet; therefore it is frequently referred to as "off-balance sheet financing".
- Bank debt is expected to be the primary debt funding source but this depends to an increasing extent on the nature of the project and the overall macroeconomic environment;
- Sponsor equity is committed, and sometimes paid up-front, prior to the provision of any debt finance but the way this is paid can vary significantly across project types; where construction companies are potentially significant players, they will bring equity in cash and in kind since they are interested in amortizing their equipment in the context of the

⁴ These include Build-Own-Operate-Transfer (BOOT), Build-Lease-Transfer (BLT), Build-Transfer-Operate (BTO), Design-Build-Finance-Operate (DBFO), and Design-Construct-Manage-Finance (DCMF).

⁵ Summarized and adapted from Macquarie Corporate Finance Ltd., *Project Finance: The Guide to Financing Transport Projects*, Euromoney Publications, 1996, p. 5.

project; The sponsor usually tries to structure the project so that the gross assets and liabilities of the project are kept off the sponsor's balance sheet.

- The project's cash flow is the principal basis for returns for both debt and equity investors...and for the payments to the government of a canon when this is one of the conditions of the award of the service to a private operator; the project's assets are the principal collateral for any borrowings;
- Payments to equity holders are subordinate to operating costs and debt service obligations...very often including payments to the government which has proven to be a source of problem in Latin America;
- Once the project is operational, lenders have no or very limited recourse to the credit of the project's owners (either sponsor equity or government in the case of BOT projects);

In general, a private sector entity (referred to as the "concessionaire") is granted a concession by a governmental entity to design, build, and/or operate transport services or infrastructure for a specified period. The concessionaire typically is responsible for raising the finances required to carry out the project. At the end of the concession period, the facilities and their operation may be transferred to the host government, depending on the nature of the contract. The concessionaire will typically take care of forming the Special Purpose Vehicle (SPV).

However, the difficulties encountered in emerging markets in the 1990s and the well-publicized problems experienced by some transport infrastructure projects have forced both the private and public sectors to expand the idea of project financing. While the ultimate goal may be to arrange project borrowings which will provide a minimally expected rate of return to sponsor equity and at the same time be completely not demanding for the sponsor or the government, such a goal has proven almost impossible to accomplish, except in a few extraordinary situations.

This gap between goals and reality has led to a popular misconception that project finance means off-balance sheet financing to the point that the project is completely self-supporting without guarantees or other support from financially responsible parties. As described by Nevitt and Fabozzi, "The key to a successful project financing is structuring the financing of a project with as little recourse as possible to the sponsor while at the same time providing sufficient credit support through guarantees or undertakings of a sponsor (government), or third party, so that lenders will be satisfied with the credit risk."⁶

The Advantages of Project Finance

The advantages of project finance depend on your position and viewpoint. Promoters of project finance (sponsors and investment bankers) prefer project finance because it has allowed them to undertake projects without exhausting their ability to borrow for traditional projects, and without increasing debt ratios (or at least those that are calculated based on reported financial statements). Project finance structures can be used by companies to limit their financial risk to a project to the amount of their equity investment.⁷ In addition, if the project

⁶ P. K. Nevitt and F. Fabozzi, *Project Financing*, Sixth ed., Euromoney Publications, 1995, p. 3.

⁷ The non-recourse nature of the debt in a project financing may change during the life of the project. For example, debt may be structured to provide recourse to the project sponsor only during the construction and commissioning phases.

itself has particularly strong and secure cash flows, project finance may allow more debt to be employed in the financing mix, since creditors do not have to worry about project cash flows being siphoned off for other corporate uses.

Project finance may provide stronger incentives for careful project evaluation and risk assessment. Since the project's cash flows are key to obtaining financing, such projects should undergo careful technical and economic review and sensitivity analysis. This may lead to clarification of the nature and magnitude of project risks and what causes them. Having an detailed, objective assessment of project risks and potential may not only enable risks to be allocated to the appropriate parties, but in some cases, the project analysis itself may reveal ways to change the project to reduce the overall level of risks or to improve their allocation. For example, demand analysis of a toll road may show opportunities to delay expansion until certain traffic levels trigger new investments in capacity.

The Disadvantages of Project Finance

Project finance transactions are more complex than traditional corporate or public financing, typically involving many more parties and resulting in significantly higher transaction costs. The complexity of project finance deals also makes them very expensive. The due diligence process conducted by lenders, legal counsel, and other technical experts results in higher development costs, with higher fees and interest margins than what is typically charged. It is not unusual for the total cost of a project finance transaction to cost twice as much as straight debt or equity finance. Total costs may reach 7 to 10 percent of total project value. When acting as a financial advisor to a project, investment banks will typically charge fees of \$20,000 to \$30,000 per month, plus all expenses. They also typically receive a success fee if the project reaches financial closure, which can range from .0025 to 1.0 percent of total project value.

Negotiations on various aspects of the project are usually protracted and may be quite contentious. This is especially true for transport projects, which typically are politically sensitive, have high visibility, and retain strong public interest and participation. Getting parties with diverse interests to agree on the nature and magnitude of risks is very hard, let alone getting them to agree on who should bear these risks. The documentation associated with project financing is almost always complex and lengthy.

Even after the financing is closed, the project will usually be subject to closer monitoring by all parties. Because lenders primarily rely on revenue flows to repay their loans, the degree of lender supervision of the management and operation of the project will most likely be greater than for an ordinary corporate loan. Likewise, public officials need an ongoing program to monitor contract compliance and potential exposure to any guarantees that have been provided, as well as regulatory oversight when deemed necessary.

Risk Identification, Analysis and Management⁸

The identification and management of risks is essential in any project financing because of the non-recourse or limited recourse nature of project debt and the limited contractual

⁸ This section is drawn from P. K. Nevitt and F. Fabozzi, *Project Financing*, Sixth ed., Euromoney Publications, 1995, chapter 2; Wilde Sapte, *Project Finance: the Guide to Financing Build-Operate-Transfer Projects*, Euromoney Publications, 1997, chapter 1; Macquarie Corporate Finance Ltd., *Project Finance: The Guide to Financing Transport Projects*, Euromoney Publications, 1996.

undertakings of the project owner. Since each project faces a different set of risks, it is always best to try to identify them at the outset and allocate them to the appropriate parties. This is why one of the first tasks that public officials should address is to understand the distribution of risks to which each party is committed. In many renegotiations or regulatory disputes, the ultimate responsibility and resolution will be based on the assignments spelled out in the contract.

The potential varies for a risk to actually occur. One study showed that 82 percent of all projects experienced some material problem after financial close.⁹ Even if the actual percentages are not that high, almost every major transport project in recent years has involved some degree of restructuring and renegotiation.

One of the long-standing tenets of project finance has been that the project participant who controls or is best able to manage the risks should bear them. While true in principle, reality often fails to live up to the goal. Risk allocation is complex and difficult, and for all practical purposes it is a negotiated process. For example, governments are responsible for changes in the law, yet the risk and consequences of such changes are often shifted to the private sector. Or, the central bank may have the greatest responsibility for inflation and interest rate outcomes, yet in reality it is often the project developers, creditors, and equity providers who end up bearing the interest rate risk. There are numerous other risks that do not necessarily end up being borne by the party best able to manage it. More often, it is the best and most experienced negotiator that ends up bearing the least amount of risk.

Also, the level and type of risk encountered may change over time. The 1998 Asian crisis increased perceived risk levels enough to increase the required rate of return to levels unachievable for most projects. On the other hand, governments may fall prey to a “fear-greed cycle”, in which governments become afraid of program failure and thus offer increasingly better terms. Alternatively, prospective concessionaires who worry that they will get left out bid unrealistically. Subsequently, the element of greed takes over in which governments may fail to live up to commitments and the private sector seeks ways to privatize gains and socialize the project’s risks.

Successful projects have been characterized by a broad level of risk-sharing between the public and private sectors. Generally, the private sector is better at managing commercial risks and responsibilities such as those associated with construction, operation, and financing. In contrast, transport projects most likely depend on public participation in areas such as acquisition of right-of-way, political risk, and in some cases, traffic and revenue risk. Project finance has worked best when experienced, well-capitalized firms have enough discretion over design and confidence in toll policy to accept construction and some degree of traffic risk, while the government assumes the risks that it controls and gives consideration to financial support or guarantees if traffic levels in the early years are insufficient.

We next turn to an analysis of the principal risks in transport project finance. When making such an assessment, it may be useful to generate a comprehensive risk matrix that lays out the main risks, their perceived likelihood, and how they are to be managed. One such example of a risk matrix is shown in Table 1.

⁹ S. Hoffman, “A Practical Guide to Transactional Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations,” *The Business Lawyer*, Vol. 45, November 1989, pp. 181-232.

Construction Phase Risks

During this phase, the major risks are delays in completion and the commencement of project cash flows; cost overruns with an increase in the capital needed to complete construction; and the insolvency or lack of experience of contractors or key suppliers.

Construction costs may exceed estimates for many reasons, including inaccurate engineering and design, escalation in material and labor costs, and delays in project start-up. Cost overruns typically are handled through a fixed-price and fixed-term contract, with incentives for completion and for meeting pre-specified investment goals. Other alternatives include provision for additional equity infusions by the sponsor or standby agreements for additional debt financing. It is always sensible for developers to establish an escrow or contingency fund to cover such overruns.

Delays in project completion can result in an increase in total costs through higher capitalized interest charges. It also may affect the scheduled flow of project revenues necessary for debt service costs and operating and maintenance expenses.

Availability of Materials and Equipment

In many developing countries, the risk of equipment or materials for construction or operation must be considered. This is especially true with respect to rolling stock or in for specialized equipment, like gantry cranes or loading bridges used in ports or airports. Transit bottlenecks, tariffs, foreign currency fluctuations and other factors can cause a significant increase in costs.

Contractor capability

The main contractors and key subcontractors should have the experience, reputation, financial, technical, and human resources to be capable of completing the project in timely fashion on budget. This risk is best addressed through tough pre-qualification of bidders (if sponsors are also contractors); through certification and monitoring if unrelated parties are used; and by ongoing financial oversight of the contracting companies themselves, to make sure that poor results from other projects or from weak balance sheets do not spill over into the specific project of interest.

Table 1: Hypothetical Summary Risk Allocation Table for Transport Project Finance

Risk	Contractor	Operator	Equity	Lenders	Government	Insurance	Unallocated
Construction Phase							
1. Cost overruns/delays due to:							
design	*						
engineering	*						
construction	*						
2. Change in legal requirements							
federal					*		
state					*		
local					*		
3. Land acquisition					*		
4. Weather							*
5. Natural disasters							
insurable						*	
uninsurable							*
6. Industrial action							
site specific	*						
general					*		
7. Environmental							
EIS breach	*						
known or caused by state					*		
other-major							*
other-minor	*				*		
8. Civil disobedience							
facility-related	*						
other					*		
9. Traffic and activity relocation	*				*		
10. Insurance							
fire						*	
Workers compensation						*	
public liability						*	
11. Force majeure							*
12. Confiscation							
state					*		
federal					*	*	
13. Approvals/licenses/permits	*				*		
14. Variations							
by government					*		
by contractor	*						
15. Interest rate risk			*	*			
16. Taxation	*		*	*	*		
17. Other tariffs and charges		*	*		*		

Risk	Contractor	Operator	Equity	Lenders	Government	Insurance	Unallocated
Operating Phase							
1. Revenue/Traffic/Demand			*	*	*		
2. Operation		*					
3. Maintenance		*					
4. Defects liability		*					
5. Natural disaster							
insurable						*	
uninsurable							*
6. Industrial action							
site specific		*	*				
general			*		*		
7. Environmental							
known or caused by state					*		
other-major			*		*		
other-minor			*				
8. Civil disobedience							
facility-related		*					
other					*		
9. Insurance							
fire						*	
Workers compensation						*	
public liability						*	
10. Force majeure							*
11. Confiscation							
state					*		
federal					*		
12. Interest rate risk			*	*			
13. Taxation			*	*	*		
14. Other tariffs and charges		*			*		

Source: Adapted by the author from Macquarie Corporate Finance Ltd., *Project Finance: The Guide to Financing Transport Projects*, Euromoney Publications, 1996, pp. 87-88.

Environmental and Land Risks

Transport projects can have a substantial environmental impact. Such projects frequently attract strong opposition from community and environmental groups over issues of pollution, congestion, neglect of public transport and visual impact. Similarly, land acquisition can be a protracted process with the potential for extensive legal delays, particularly in developing countries.¹⁰ In general, the public sector often ends up taking on the responsibility for most of these risks since often it is easier for the public sector to take the responsibility for acquiring the rights-of-way, pay for them and contributes this asset to the project. Project sponsors often try to ensure that the government bears the risk of providing all necessary land within a given time frame or be liable for damages. Furthermore, the cost of land acquisition can become a major factor where land values have risen rapidly or are subject to speculative

¹⁰ For example, land assembly was a major factor in delays in the construction of the Bangkok elevated highway.

activity over which the project developer has no control. In these cases, agreement on some form of cost ceiling may be necessary in the concession contract.

In some cases, a special government body may be charged with implementing the land acquisition process. Generally, the host government should ensure that required licenses and permits be obtainable without unreasonable delay or expense.

Start-Up and Operating Phase Risks

The major risks for transport projects in these stages relate to traffic/revenue risk; regulatory and legal changes; interest rate and foreign exchange risks; force majeure risk; and political risk.

Technology Risks

Project finance participants cannot ignore new technologies since they can either significantly improve the profitability of a project or adversely affect any project that uses obsolete technology. For example, the use of automatic toll collection technology reduces collection costs and incentives for graft. Another example is technological improvements in customs processing, so that border crossings on major arterial toll roads can be traversed more quickly, saving time for users and making the road more valuable.

Traffic and Revenue Risks

Unlike project financing in other sectors, take-or-pay or fixed-price contracts are typically not available in transport, so that demand risk is a major issue in virtually all projects. Even when there is a reasonable level of confidence in forecasts, demand can be dramatically affected by competition from other modes or facilities, changing usage patterns, and macroeconomic conditions. These interrelated issues, over which the project sponsor often has little or no control, are very difficult to predict and represent a major risk to financing. In particular, forecasting during the early years can be quite subjective. To the extent that these risk are driven by economic conditions, there is a potential role for the government to play in risk-sharing, either through traffic or revenue guarantees or other forms of support. (These are discussed in more detail below.)

But demand uncertainty must be viewed with a steely-eyed perspective. Over-optimism is common for privatization teams focusing on convincing private operators of the value of their business and for potential operators who want to get the deal, convinced that they can renegotiate almost anything once they have taken over the business. To see this, take the case of toll roads. Traffic volumes are very sensitive to income and economic growth and the failure to recognize this may be one of the main reasons why so many toll road projects have failed or ended in bitter renegotiations. Motorization and vehicle-kilometers traveled tend to increase faster than income levels. This high income elasticity, especially for leisure trips, makes toll roads especially sensitive to macroeconomic conditions. For roads that serve export activities, exchange rate changes can dramatically affect trade, leading to major changes in demand patterns. Many toll road projects in the last decade have dramatically overestimated traffic levels. In some of the Mexican road concessions, traffic volumes were only one-fifth forecast levels. In Hungary, the M1 Motorway attracted only 50 percent of expected volume in its first year of operation. The Dulles Greenway, outside of Washington, only attracted one-third of its expected daily volume. Even after a toll reduction of forty percent, the Greenway still was only able to achieve two-thirds of its originally forecast volume.

Financial Risks: Interest Rates

Financial risk is the risk that project cash flows might be insufficient to cover debt service and then to pay an adequate return on sponsor equity. Financing constraints, especially the lack of long-term debt capital, are a significant hindrance to toll road development. Since the advent of financial crises in emerging markets, few projects are able to generate returns on investment sufficient to attract private capital. This suggests that until macroeconomic risk premiums decline and traffic growth is more established, only a limited set of projects will be undertaken without substantial government support. The financial crises will force many programs to slow down and force debt restructuring of many of the existing concessions. There is a need to promote more secure financing structures to reduce the risk of potential bailouts.

Because toll roads are long-lived investments with high start-up costs, countries with local capital markets that are capable of providing long-term financing have many advantages. Of particular importance is the available maturity of domestic finance. In many countries, new toll concessions have been unable to obtain financing longer than 5 to 6 years, creating a major refinancing risk that either renders the project nonviable or requires government guarantee of such a rollover.

In theory, financial risk is best borne by the private sector, but in transport projects there is likely to be substantial government risk sharing either through revenue or debt guarantees, or participation by state or multilateral development institutions. There also may be cash grants or other financial contributions that serve to improve the project rate of return on private finance.

Currency Risk

The main currency risk is driven by the impact on the value of the business of fluctuations in the exchange rate. In addition, the toll concession can be subject to a convertibility risk which refers to the possibility that the operator may not be allowed to exchange local for foreign currency. These are major issues for some projects, where revenues are commonly in local currency and adjustments for inflation and exchange rates may lag or encounter political opposition. Projects can reduce this risk by tapping domestic capital markets where possible. Most projects attempt to mitigate exchange risk by provisions for indexing to inflation, although in practice the magnitude of exchange volatility has made such requirements difficult to enforce.

Force Majeure Risk

Force majeure refers to risks beyond the control of either the public or private partner, such as floods or earthquakes, which impair the project's ability to earn revenues. While some private insurance is becoming available for catastrophic risks, the public sector generally is faced with the need to restructure the project should such disasters occur. This may take the form of extending the concession term, or to provide additional financial support. The rule is that remedies in the event of force majeure risks should be stated in the contracts; for example cash compensation or an extension of the concession term equal to the length of the disturbance.

Regulatory and Legal Risks

Regulatory risk stems from the weak implementation of regulatory commitments built into concession contracts but also in laws or other legal instruments relevant to the value of the transaction. The question asked is whether the regulator will exercise its authority and

responsibilities over prices, public obligations, competition rules and similar rules that are specified in the contracts and that influence the value of the business. The solution is to try to make sure that regulators have rules to follow and that they are independent enough to be able to enforce them.

But even if regulatory rules are clear enough, they are only as effective as the regulators can be. The best designed regulatory environment is useless if the regulator is not independent or fair. This risk is more common than it appears and pressures on regulators are a major source of concern which investors reflect in their required rate of return. In 1999, a major factor in the restructuring of Mexico's toll road program was the pressure on regulators to cut tolls. In Thailand, a similar concern resulted in decision by the government to cut by 50 percent a toll level it had committed to in a BOT contract. The outcome was that the government ended up taking over the facility.

Project finance structures typically cover periods of ten years or more. The relevant legal and regulatory environment is likely to change substantially over that period. The rules dealing with the financial consequences of these changes between government, users and operators are critical and yet often forgotten. The rules must cover the possibility of adaptation of the contract terms during the tenor of the project financing.

Political Risk

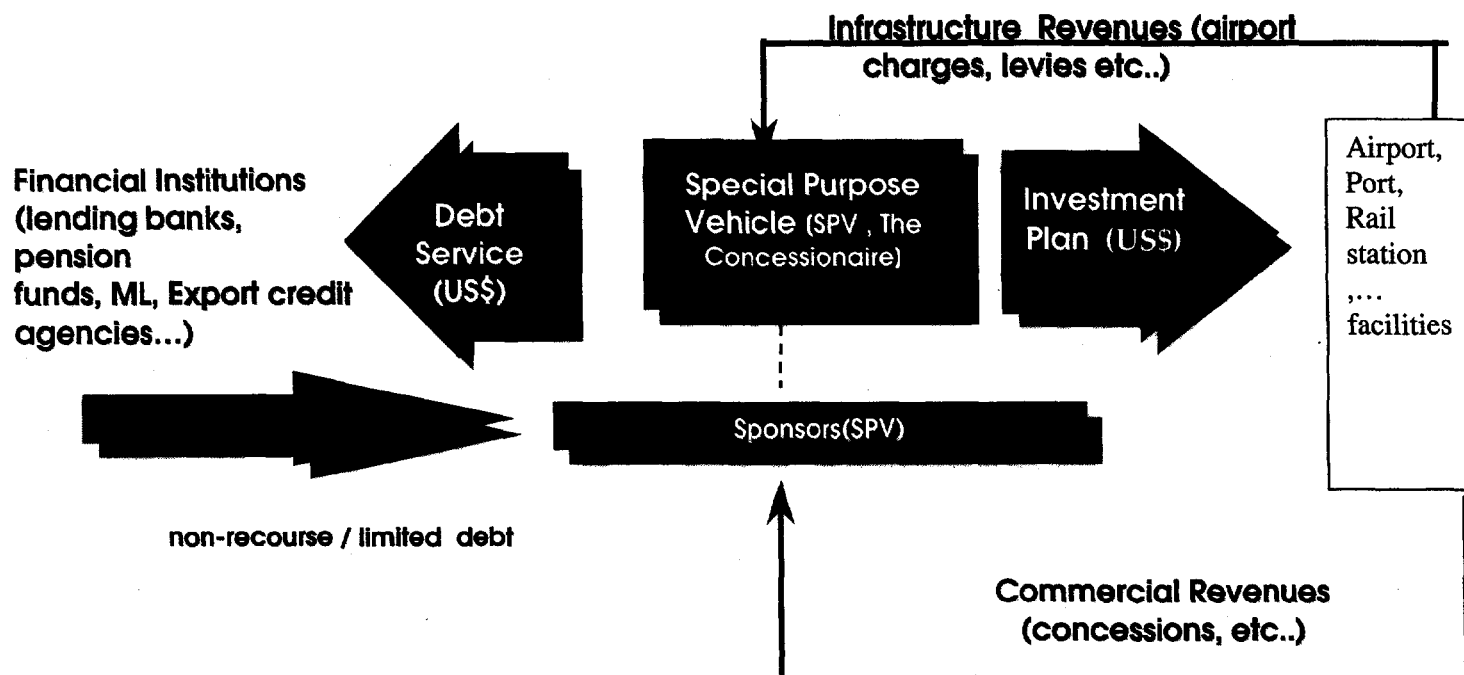
Political risk concerns government actions that affect the ability to generate earnings. These could include actions terminating the concession; imposition of taxes or regulations that severely reduce the value to investors; restrictions on the ability to collect or raise tariffs as specified in the concession agreement; precluding contract disputes to be resolved in reasonable ways. Governments generally agree to compensate investors for political risks, although in practice justifications for government actions may be cited to delay or prevent such payments. Thus, private investors generally assume the risks associated with dispute resolution and the ability to obtain compensation should the government violate the concession agreement. The issue of meeting financial obligations while disputes are resolved may be achieved through a requirement of debt service reserves, escrow, or standby financing.

The credibility of the government to uphold contractual obligations and the willingness and ability to provide compensation for political risks are key issues for project finance. Issue of delays or denials of tariff increases have made many prospective parties wary of entering into new projects. This is especially true for foreign capital, which is perceived as especially vulnerable to political risks. Some of the more risky emerging markets may require support from multilateral or bilateral financial institutions to reduce this risk exposure. In addition, political risk insurance may also help manage issues of inconvertibility, transfer, and confiscation.

Main Participants and Their Roles in Project Finance

Project finance involves a large number of participants, each with important roles to play. A typical organizational structure is shown in Figure 1. The interests of the major parties are discussed below.

Figure 1: Standard organizational structure



Government

It normally will be the government that perceives the need for an infrastructure project and determines whether it is suitable for project financing. This, of course, will depend partly on the political and economic situation facing the country, as well as the characteristics of the project itself. It might be necessary to enact specific legislation, or even to change the constitution, to enable the financing to proceed. (Many national constitutions prohibit private ownership or control of essential public facilities.) In addition, since project finance is critically dependent on contractual obligations between many parties to the deal, it might be necessary to enact legislation specific to the project or sector. It also may require clarifying laws relating to the recognition and enforcement of contractual obligations and security rights, or the laws relating to nationalization, expropriation, and arbitration. The regulatory regime within which the project is to function should also be clearly defined.

The public sector typically is interested in obtaining needed infrastructure or services at reasonable cost and with attention to social aspects. This will almost inevitably involve the government making comparisons with the economics of the project using public funds. While in many cases public sector borrowing costs will be lower, other factors should be considered, including the opportunity cost of public funds and foreign exchange and the efficiency and expertise the private sector might bring to the project.

The Concessionaire

The project sponsors normally will form a Special Purpose Vehicle (SPV) to act as the concessionaire. The precise form of this entity will depend on the circumstances, taking into account the fiscal, accounting, and legal treatment of the SPV vis-à-vis the parent equity sponsors. The relationship between the sponsors needs to be clearly defined and will usually be set out in a shareholders' agreement. The SPV might have other equity investors, such as development finance institutions or the government. The SPV will be capitalized by the sponsors in agreed proportions, normally on the terms set out in an agreement that deals not only with the sponsors' initial capital investments but also with any further obligations with respect to future contribution obligations.¹¹ In addition, rules need to be established with respect to how the SPV is to be administered, how it is to be financed, how sponsors share profits, and how, if at all, sponsors may transfer or sell their shareholdings or interests in the SPV. This aspect has become increasingly important, as the need for a larger equity share in the financial structure has meant that more than one company is likely to be involved as sponsor. The rise of such sponsor consortiums is potentially difficult, as construction company investors may have shorter time horizons than longer-term strategic or operating equity investors.

Lending Banks

Most project finance funding to date has been in the form of commercial debt. The percentage of the anticipated project cost that commercial banks will be prepared to lend will vary depending on such issues as the size and sector of the project, the projections and sources of project revenues, and the banks' evaluation of the other risks of the project. The banks usually lend directly to the SPV (concessionaire).

The banks will be expected to finance the project on a non-recourse or a limited recourse basis, emphasizing project revenues as the primary source of repayment of interest and principal. In return for agreeing to finance the project on such a basis, the banks are likely to require the ability to exercise a considerable degree of control over the SPV and its activities, and to have "step-in rights" should any one of a large number of triggering default events occur.

Other Lenders

The SPV might also be able to borrow from other sources, particularly national and regional development banks, bilateral agencies, export credit agencies, and development finance institutions. In particular, multilateral financial institutions have played an expanding role, not only in terms of financing and technical assistance, but also in terms of risk management and insurance instruments that have almost become prerequisites for private financing. It also may be possible to utilize leasing activity to lower after-tax costs of financing.

Other Parties to the Project Contracts

As the SPV is usually only a legal construct, it needs to ensure that it performs its obligations under the concession agreement by sub-contracting those obligations to third parties. The principal parties usually are the construction contractor and the operator of project facilities. It is common for one or both of these parties to be part of the sponsor consortium, or an affiliate of the sponsors.

¹¹ These may be supported by guarantees of parent or affiliated companies of the sponsors.

The SPV also will need to insure that it has adequate supply contracts for raw materials and linked services. For example, airport concessions require contracting with air navigation authorities for air traffic control services. In some cases, the project will require agreements with external parties for project outputs, such as the use of ports by shippers.

Where Does the Money Come From? Types and Sources of Project Finance Funding

There are a number of different potential sources of funding for project financing, each with different positions, stakes, and incentives that influence the project outcomes. Some of these sources may only be available at different stages in the life cycle of the project. These sources include the following:

- equity
- mezzanine finance
- commercial lending
- bond finance
- project leasing
- development finance institutions
- export credits, finance, or guarantees provided by bilateral export credit agencies
- derivative products, including securitization

Equity

The principal equity investors in project finance will be the sponsors, although several other parties might contribute equity to the SPV – for example, the government, some institutional investors, and in some cases, the general public through share offerings.¹² Equity is the lowest ranking form of capital because the claims of the equity investors will rank behind creditors of the SPV. In addition, as a matter of contract, the lenders to the project are likely to restrict the amount and timing of dividends and other distributions to equity holders. The equity investors, therefore, bear the greatest risk of loss if the project is unsuccessful, and will therefore seek a much higher rate of return from the project than, for example, holders of senior debt. On the positive side, the equity holders gain disproportionately if the project performs better than expected.¹³ It should also be noted that if the project assets revert to the government at the end of concession term, then increased investment brings no inherent benefit to equity; sponsors gain only if project revenues and profits are increased as a result.

Although project finance is supposed to be organizationally distinct from parent equity holders, in practice not all equity is created equal! In the initial stages, sponsors are likely to fund their equity contribution either internally or from on-balance sheet borrowings. Governments should be careful to monitor the sources of this initial investment. In some cases, while the project equity appeared sound, the additional borrowing by the sponsor's parent

¹² Different forms of investment other than straight equity might be considered as “pseudo-equity”. For example, in the UK, project sponsors will commonly consider lending debt to the SPV that is subordinated to all other borrowings. This might be considered as an alternative to additional equity, and is normally based on tax considerations and standing in bankruptcy should the concession fail.

¹³ In some cases, the concession contract will impose a maximum allowed return on equity, or a gain-sharing mechanism beyond a certain level of return.

company so weakened the overall company that bankruptcy of the parent impaired the ability to undertake the specific project obligations.

Another issue that has changed over time is the expectation that amounts invested by sponsors (especially by construction companies) will be at least partly matched by the profits that the sponsors expect to derive from the associated contracts for work on the project. This creates an incentive to overstate contract costs, especially if such work is done on a cost-plus basis with a pre-set profit margin. In some cases, such as Mexican toll roads, construction company sponsors were permitted to count such profits as their initial equity contribution. This “in-kind” equity, unfortunately, does not bear risk or provide financial support in the same way that cash investment does.

However, in the wake of the financial crises in emerging markets, the required percentage of risk-bearing equity capital generally has risen, so that construction profits typically are not enough to cover required capital contributions. This has led to demands for more cash backed by parent equity, and by expanded efforts to construct sponsor consortiums that may include operators, strategic investors who are likely involved in the business, and perhaps the government itself. The net result is that equity holders can no longer look solely to short-term construction profits to generate their required returns; there is a need for an ongoing stream of residual revenues over the life of the project. This development is a healthy one, as it aligns the incentives of sponsors more with those of long-term lenders.

The proportion of a project’s anticipated funding needs which come from equity will vary from project to project. Considerations specific to each transport sector are discussed later in this chapter, as are risk factors and their allocation and mitigation. In general, the amount of equity will depend on:

- *Project economics*: The greater the revenue or commercial risks, the lenders will require sponsors to contribute a higher percentage of project funding. For example, capacity expansion of an existing toll road with a long traffic and revenue history will likely be seen as less risky by creditors and will thus enable more leverage in the project finance structure.
- *Required Return (Cost) of Equity*: The higher the required level of return on the equity share of the project, the higher the overall project cost. A government may seek a balance between higher financing costs with more equity or greater financial risk but lower potential financing costs if more debt is used. Beware, though – too often the appeal of up-front financial savings through use of more leverage or short-term debt has been irresistible to politicians, especially nearing elections. This has led to project failures where early cash flows were unable to sustain debt coverage – but by then it was someone else’s problem. The lesson is that all structured financings have both project risk and financial risk. The skill is in balancing the two, so that as project returns become more secure over time, additional debt financing might be incurred. Note that this is just the opposite of what often occurs in practice, where highest debt levels often occur during the early stages of the investment, when project risks (especially demand risks) are greatest. Once a project is in operation and has a track record, the SPV, its sponsors, creditors, and the government may want to reconsider the structure of financing.
- *Country risk*: Concerns about institutional and macrofinancial matters often lead to lenders requiring greater equity investment.

- *Government and legal requirements:* Accounting standards and laws may restrict the types of sponsors and the nature of equity contributions. For example, special treatment may be required for local control if foreign sponsor equity is to be used (for example, a golden share). The amount and nature of equity also will depend on the degree to which recourse is permitted to the parent company with respect to third party creditors (suppliers, contractors) if payment is not made by the SPV. The host government also might require a minimum level of equity as a precondition for the concession and might require investment by parties other than the sponsor.

One of the key requirements of sponsors is to limit (to the extent possible) their prospective financial exposure to an underperforming project. This absence of a “big balance sheet” or “deep pockets” to support the project on the downside forces the lenders to assume a part of project risks. This is what makes project finance different, and why issues related to the structuring of debt are critical. In fact, much of the drop-off in project finance activity since 1997 has occurred because project arrangers have not been able to structure debt packages that provided enough security without charging interest rates that are so high that the project is no longer viable.

Mezzanine Finance

Mezzanine finance falls somewhere between senior debt and equity. Examples include subordinated debt and preference shares. Payments are made to these investors only after senior debt is serviced and will only be made if certain conditions are satisfied, such as minimum coverage ratios or investment requirements related to the performance of the project. The risks taken by mezzanine providers are greater than those of senior creditors, and so required returns will be higher (but lower than those required by traditional equity investors). This higher expected return might be provided by a higher interest rate; a stated preferred dividend rate; or ways to share in the profits, such as share options or warrants.

Mezzanine capital might be provided by certain investment trusts, mutual funds, or insurance companies. The benefit to the sponsors is that the amount of equity required is likely to be reduced. Lenders of senior debt should also welcome the addition of mezzanine investment.

Commercial Lending

Given the long term nature of investments, project finance generally seeks committed term loans with a structured repayment profile. Revolving credits – where funds are drawn and outstanding for short periods before being repaid – may be unsuitable given that many infrastructure projects take a while to begin to generate cash flows large enough to service debt interest, let alone principal repayment.

In some cases, construction financing is provided on a short-term bridge loan basis. Once the project is completed, these bridge loans are to be refinanced with longer-term debt. Unfortunately, one of the consequences of the recent turmoil in emerging markets has been that long-term debt capital has not been available – the bridge financing was unable to cross the river! In response, many projects now seek longer-term committed financing at the outset or have sought guarantees from multilateral financial institutions that such financing would be available when needed.

Given the complex nature of project financing, the arranging of such syndicates is limited to a relatively small group of commercial banks, with (at least in theory) the ability to analyze both the commercial and political risks of a project. In general, the senior debt will be syndicated to a number of commercial banks; each of the syndicate banks will be willing to lend on the same terms and conditions. The syndicate will be subject to the same priority of debt, sharing receipts and committing to a consensus before any terms of the borrowing are changed.

At the construction stage of the project, revenues may be unavailable to service debt. The relationship between the drawdown of debt versus the drawdown of equity or other capital will be negotiated at the outset and will be contained in the "term sheet" of the commercial loan. This drawdown of debt results in an liability comprised of both principal and accrued interest.

Debt is usually at its highest level on handover of the project to the SPV, and includes interest capitalized during construction phase. The profile of debt service and loan repayments should follow the expected trend of revenues; this often requires project sponsors to forego dividends in the early years of operation.

Commercial lenders typically see themselves as only medium-term creditors, usually expecting to be repaid between three and seven years from the beginning of operations. The number of projects that are capable of paying back debt in this period is quite limited, thus requiring either refinancing or rollovers to longer maturities. In practice, this has been quite difficult, as local banks in emerging markets may not be able to handle such amounts. On the other hand, long-term risks of currency depreciation and limited hedging opportunities make it unattractive for international banks to lend, despite higher interest rates. This is why macrofinancial risks are so damaging to the market for project finance.

Because commercial banks fund themselves by raising short-term funds at a floating interest rate, they are not in a position to lend long-term funds at a fixed rate without hedging their interest rate exposure. But the potential for hedging is limited in many developing countries, and availability of hedging reduces with lengthening maturities in any case. As a result, commercial debt tends to be floating rate of medium term.

Bond Finance

As a major source of general corporate finance, it is perhaps surprising that only a very small proportion of project finance is funded through capital markets, especially when you consider the pricing, maturity and flexibility inherent with Eurobonds or domestic bonds. However, some features of bonds are not amenable to project finance structures, although increasing sophistication in techniques and instruments and the growth of institutional investors seeking longer term, higher-yield returns may spur use of bonds in project finance. Given the problems of floating rates and medium terms of commercial debt, such development might well be the single most important factor in the expansion of project finance opportunities.

Bonds typically are of longer maturity and carry fixed rates. They also contain fewer restrictive covenants. The Eurobond markets tends to be deeper, with a broader investor base than commercial debt finance. Because Eurobonds contain many standardized features, they tend to be negotiated more quickly and thus reach financial close faster.

Unfortunately, the more flexible covenants and standardization result from having recourse to the borrowing entity – the very aspect that makes project finance unique. Thus, the development of project bonds will require different approaches to covenants and liability, making them more like commercial loans.

Bond finance has other potential disadvantages in a project structure. The single up-front subscription limits the ability to draw down funds as needed, thereby increasing capitalized interest charges.¹⁴ The lack of a lead bank may reduce the ability of the sponsor to obtain waivers for project changes. Disclosure requirements are greater, and interest rate volatility means that markets change dramatically shut down for all but the most creditworthy borrowers at times.¹⁵

The traditional bond structure does not provide any mechanism for flexibility in the monitoring and control of the project. This presents a problem, as the ability to react to changing circumstances affecting the project is an integral part of successful project finance. Sponsors require a central point of contact with creditors a role played by the lead commercial banks but not assumed by the trustee of a bond issue (they have different legal standing and exposure.)¹⁶ Also, unlike many commercial lenders with long experience in project finance, most bond investors lack sectoral or country expertise to be an active participant. Although a number of project bond issues have been completed without specifically addressing these problems, they have mostly been through private placements to major institutional buyers, such as the US 144a market.

In order to expand the use of bonds in project finance, insurance companies have become more active. One approach is to have bond issues guaranteed by a monoline insurer, who provides a financial guarantee to investors. The sponsor then has a central point of contact for renegotiation, waivers, or changes. Investors rely on the guarantee provided by the insurer. The bondholders exposure is thus converted primarily to the monoline insurer's balance sheet and away from project risk. To date, these initiatives have been primarily used in developed economies, such as providing credit enhancement for an extension of the London Underground. With the increasing interest and the introduction of hybrid approached mixing insurance and project risks, it is likely that the project bond market will become an entirely new asset class in project finance.

Leasing

Leasing involves ownership of an asset by one party who provides the right to another party to use it for a fixed period of time in exchange for payments (rental). While accounting, tax, and legal status vary across countries, leasing is potentially very attractive for project finance. First, costs may be lower as tax benefits (depreciation) to the lessor may be available earlier than if they remained in the project company. Second, it intrudes new sources of finance, since manufacturers or asset-based finance companies are not normally project lenders. Third, in countries where laws recognizing property and security interests are not well-

¹⁴ This is called *negative carry*, in which investment returns on cash and liquid investments on funds received but not yet utilized are less than the interest rate on the bonds themselves.

¹⁵ For example, medium rated corporate borrowers in the United States have saw spreads over US Treasuries more than double between 1998 and 1999.

¹⁶ In some cases, the introduction of a *project agent*, acting on behalf of bondholders, has been used. Other cases have delegated bondholder review of project changes to participating commercial banks, covered under a set of intercreditor agreements.

developed, there is an advantage in having the lessor retain ownership. The combination of these features can enhance the economic viability of project finance.

However, leasing does add further complexity to the transaction. For example, special agreements may be required as to what happens to leased assets at the termination of a concession. A new set of agreements between lenders and lessors are required, since withdrawal of the leased asset typically kills the project operation (for example, the leasing of rolling stock in a rail concession). Finally, to the extent that leasing benefits are tax-driven, governments should decide whether the specific project finance benefits are would the broader fiscal cost to the treasury.

Development Finance Institutions

Development finance institutions (DFIs) exist to foster growth in developing countries. In this regard, they differ from export credit agencies, which serve to promote exports from that particular country. Most of the DFIs involved in project finance are multilateral in nature. Their assistance usually takes the form of non-concessionary rate funding to commercially viable projects. There has been an increased emphasis on private sector investment over that in the public sector. While there has always been concern on the part of other lenders that DFIs tend to side with sponsors or host countries, , this view is usually offset buy the political comfort, country knowledge, and “catalytic” benefits DFIs bring to a project. The outgrowth of DFI experience and ties in (at least some) developing countries has led to what the IFC terms “an honest broker role”. DFI involvement may convince commercial banks, export credit agencies, local investors, or governments to take an interest in a project which they might not have otherwise.¹⁷

Perhaps the prime example of DFI activity in project finance is that of the International Finance Corporation (IFC). IFC is part of the World Bank Group and, unlike the World Bank itself, can only lend to private enterprises without the direct support of a government guarantee. The IFC typically gets involved in projects through commercial loans, although it also may take equity positions. IFC lending tends to have higher disclosure and transparency requirements than traditional commercial loans. On occasion, it also provides loans with longer maturities than would be available form other lenders.

Export Credit Agencies and Political Risk Insurance

An export credit agency (ECA) protects exporters and their financiers against default, whether from commercial or political causes. It is limited to exports from the specific country. While terms vary across countries, ECA cover can be provided to insure against matters such as political risks, expropriation, major regulatory changes, exchange controls, war and political violence.

Other Providers of Political Risk Insurance

The most well-known of the DFIs offering political risk cover is the Multilateral Investment Guarantee Agency (MIGA). Importantly, MIGA coverage is available to some 135 countries. MIGA can cover risk of war and civil disturbance, expropriation, and exchange transfer restrictions. Coverage is long term, and can apply to both debt and equity investments.

¹⁷ In some cases, it is felt that the DFI might be able to exercise a degree of influence over the decisions of the government with respect to macroeconomic matters.

Where MIGA cover has been used, the financing is more attractive to commercial banks in terms of risk allocation.

The World Bank also offers political risk cover under its “partial guarantee program” and is particularly relevant to financing of infrastructure projects. The partial risk guarantee covers non-performance by the host government of contractual obligations that are part of the project. This scope of the guarantee varies, but can include such matters as an agreed regulatory framework; the supply of land or other raw materials; the performance of offtake obligations; and compensating for delays caused by government inaction or political events.

A number of private insurance companies have begun to offer political risk cover. Historically, though, such cover has only be available to select countries, for limited duration, and in relatively small amounts.

Derivative Products

Derivatives are financial contracts the value of which depends on an underlying asset. The use of derivatives in project finance applies to four main areas. First, project cash flows may move independently of or opposite to interest rates, resulting in interest rate exposure if the project is funded on a floating rate basis.

Second, some projects tend to produce local currency revenues, while financing may be denominated in foreign currency, thereby introducing exchange rate risk. Third, raw materials or finished outputs that have significant price volatility may be involved in the project.¹⁸

The Role of the Public Sector in Project Finance

There are two main reasons for government to commit to support for project financing: (i) to offset the financial or exchange risks by reducing capital expenditures or to improve revenues to the extent necessary for a project to cover debt service and provide a reasonable equity return; (ii) to offset the demand and traffic risk and protect investors (especially lenders) from the risk that actual cash flows will fall below expected cash flows and thus be inadequate to cover debt service. When unexpected events arise and a renegotiation of a contract arises, these two are often the main problems a regulator must address. The name of the game is to come up with a mix of government actions that ensures that an acceptable financial return can be generated. These actions may include some redesign of the financing schemes to include guarantees but also of the project design, including its duration.

Instruments for Public Participation in Project Finance

If public financial support is appropriate, a variety of mechanisms can be used. to support private financing. The instruments range from revenue enhancements to equity guarantees.

- Equity guarantees. They provide a concessionaire an option to be bought out by the government at a price that guarantees a minimum return on equity. Although the liability is contingent, the government in effect assumes project risk and corresponding private sector incentives are reduced.
- Debt guarantees. These guarantee that the government will pay any shortfall related to principal and interest payments. The government may also guarantee any refinancing that is

¹⁸ This need not be on a direct basis. For example, a port which predominantly serves chemical industries will be affected by the price of both raw materials and finished goods.

scheduled. It creates significant government exposure and reduces private sector incentives, although it may decrease the cost or increase the amount of debt available to the project.

- Exchange rate guarantees. With an exchange rate guarantee, the government agrees to compensate the concessionaire for increases in financing costs due to exchange rate effects on foreign financing. Exchange rate guarantees expose the government to significant risk, as well as increasing the incentive to utilize foreign capital.
- Grants/subsidies. Equity and debt guarantees all create contingent liabilities for the government. Alternatively, governments can furnish grants or subordinated loans at project inception, buying down the size of the project that needs private finance. (In Chile, the size of the government grant was one of the criteria used in awarding the South Access toll road concession.) Alternatively, explicit subsidies can be given as part of the renegotiation process. In Argentina, this subsidy took the form of a forgiveness of accumulated payments due to the government for the right to operate the concession. In general, these grants or subsidies have no provision for repayment.
- Subordinated loans Subordinated loans can fill a gap in the financing structure between senior debt and equity. From the government's perspective, they also have the attractive feature that they can be repaid with a return if the road is successful. Subordinated loans improve feasibility by increasing the debt service coverage ratio on senior debt, and by reducing the need for private equity, which requires a higher return. However, because subordinated debt does eventually require repayment, it does not improve project feasibility to the same degree as a similarly sized grant. Another alternative would be for the government to contribute financing that has characteristics of both debt and equity. One such instrument would be a "reverse convertible" contribution that would remain as equity unless the project was successful, at which point it would convert to debt for repayment.

An alternative for the regulator is to play with the design of the contract. This involved playing with the revenue from toll and with the toll levels and types, with the specification of the investment and other service obligations or with the duration of the contract

- Minimum traffic and revenue guarantees.¹⁹ A minimum traffic or revenue guarantee, in which the government compensates the concessionaire if traffic or revenue falls below a minimum threshold, is a relatively common form of support for toll roads. Typically, the threshold is set 10 to 30 percent below the expected volume and it is generally more desirable to rely on a revenue guarantee if the goal is to facilitate the access of the operator to the financial market.. This trigger reduces government exposure while providing sufficient revenue coverage to support the debt component of the capital structure. In addition, traffic and revenue guarantees help retain financial incentives in the project, unless conditions deteriorate well below forecast. If government's share "downside risk" with the private sector through guarantees, they should also consider seeking instruments that allow profit on the "upside". One way to do this is by a revenue-sharing arrangement in which the government receives a portion of revenues above a maximum traffic threshold.
- Shadow tolls. One way of providing subsidies is through shadow tolls. Under a shadow toll, the government contributes a specific payment per vehicle to the concessionaire. In

¹⁹ Note that in some countries such as Chile for instance, minimum income guarantee to protect the operator are introduced jointly with revenue sharing scheme which allow the government to share—30-50 percent— into extra profits (i.e. revenue generating a return in excess of 15 percent) when traffic is consistently above forecast.

effect, it is an ongoing revenue stream from the government in lieu of an up-front grant or loan. Because they are paid over time, they may be less of a burden on the public budget. The drawback of shadow tolls, though, is that they may not provide investors with much protection from revenue risks. That is, shadow toll payments are highest when traffic volumes are large. As a result, government payments may be inadequate to protect investors when traffic is low and may be unnecessarily high when traffic volumes are high. In addition, the payment of shadow tolls over time creates a credit risk for concessionaires. These inefficiencies can be reduced in a number of ways, such as a declining payment schedule as volumes increase or a maximum traffic level beyond which shadow tolls are not paid. Because they tend to "top off" private revenues, shadow tolls may be particularly valuable as support to low volumes roads that require upgrading or rehabilitation rather than new construction.

- Concession extensions and revenue enhancements. These types of financial support involve limited public sector risk, but also do little to support or enhance private financing. First, a government can extend the concession term if revenues fall below a certain amount. Second, a government can restrict competition or allow the development of ancillary services by the concessionaire.
- Changes in contractual obligations. A final way generally considered by regulators is to allow a redesign of the contractual obligations. Slower or less investments, fewer services obligations, are all ways of cutting costs and transforming a unviable road into a viable one.

Choosing among these Instruments

In general, the most advantageous types of support for the concessionaire are those which provide early funding streams (when revenues from the toll road are low or non-existent during the construction period) and which give guarantees for unexpected problems (for example, exchange rate guarantees). This is true at the time the contract is initially signed but also whenever the regulator is asked to renegotiate to restore financial viability to a project who may have lost it. The least significant are those which themselves are unpredictable i.e., additional rights for development around the road. These various mechanisms of government support can also be used in combination when a project is not feasible on its own and where revenue risk is substantial. In such cases, grant plus minimum revenue guarantees may be sufficient to induce private participation. Governments should avoid broad guarantees that reduce lenders' scrutiny and due diligence. In many cases, the availability of these guarantees induced lenders to provide funds based on guarantees and sponsor strength rather than underlying project risks and revenues.

Sources of Finance: Summing Up

The increasing sophistication of financing techniques in project finance is expanding the uses of derivatives as well as other areas. Many large-scale infrastructure projects now require some form of credit enhancement to make the project "bankable". This may involve completion guarantees, government guarantees in terms of traffic or revenues, and supply and offtake agreements.

Public officials often tend to view infrastructure project finance as having two sides – the public sector and the private sector. But the complexity of project finance arises just as

much from the different interests, perspectives, and incentives of the participants. There is – and probably always will be – a sense among sponsors and governments that there is an undersupply of commercial funds. There is always a significant difference between the project risks sponsors believe lenders *should* be willing to accept and those risks lenders *are* willing to accept. Throughout negotiations, the arrangers of loan finance battle with sponsors over control of the project SPV. Loan arrangers, especially after having faced “haircuts” (losses) on many project loans in the 1990s, will insist on substantial controls and monitoring of all aspects of the project that may have financial implications. Management and sponsors, by virtue of their status, tend to be more naturally optimistic and entrepreneurial, and almost always find it frustrating to deal with naturally cautious bankers (although the bankers would merely describe themselves as prudent!)

Tying It All Together: PPI, Required Returns and the Cost of Capital

The above risk factors can be pulled together in the concept of cost of capital. This represents the required rate of return that all investors, blended together, might expect on a project. Algebraically, we can write this as:

$$\text{Cost of capital} = (\text{Required rate of return on debt}) \times (\text{Percentage of debt in the project}) + (\text{Required rate of return on equity}) \times (\text{Percentage of equity in the project})$$

Since interest expense typically is tax deductible, we can calculate the cost of capital either on a before-tax or an after-tax basis. It is important to understand that the tax rate that is relevant is the one that applies to project sponsors.

We can think about the required rate of return on debt (that is, the borrowing cost) as having a number of risk factors, each of which commands a premium that must be paid to investors in order for them to bear that particular risk:

$$\begin{aligned} \text{Required rate of return on debt} = & \text{Risk-free borrowing rate for specified time horizon} + \\ & \text{Premium for country risk} + \\ & \text{Premium for currency risk} + \\ & \text{Premium for project or sector risk} + \\ & \text{Premium for regulatory risk} \end{aligned}$$

Similarly, we can think about the required rate of return on equity investment as being equal to a risk free rate plus a premium for the higher risk faced by equity relative to debt, as well as all four risk factors above. The equity risk premium is a function of how risky a specific sectoral investment is relative to equity markets overall. (This adjustment factor is known as beta.²⁰) Thus,

$$\begin{aligned} \text{Required rate of return on equity} = & \text{Risk-free borrowing rate for specified time horizon} + \\ & \text{Equity risk premium (adjusted by project beta)} + \\ & \text{Premium for country risk} + \\ & \text{Premium for currency risk} + \end{aligned}$$

²⁰ See I. Alexander and A. Estache, “A back-of-the-envelope approach to assess the cost of capital for network regulators,” mimeo, World Bank, December 1997.

*Premium for project or sector risk +
Premium for regulatory risk*

While in many cases the risk premiums required would be similar for debt and equity, this will not always be the case. For example, regulatory lags in approving pricing decisions may have a greater effect on equity holders, since creditors have a prior claim.

The next step is to consider the appropriate mix of debt and equity. This is known as the capital structure or the funding structure. While much theoretical work has been done on optimal capital structures, in practice it is essential to know the capacity of the debt and equity markets; their willingness to invest; and the levels of return required. It is important that the funding structure is appropriate for the deal under consideration, as financing mix should vary between different asset types and the size and volatility of revenue streams.

In practice, criteria like the Debt Service Cover Ratio and Loan Life Cover Ratio, default provisions, and debt and maintenance reserve requirements are all crucial in putting the debt funding package together.

The Debt Service Cover Ratio (DSCR) is an important measure used to determine how easily a project can service its scheduled repayments. The DSCR typically is calculated on a rolling annual or semiannual basis as:

$$DSCR = \frac{\text{Cash flow before debt service}}{\text{Debt service}}$$

It is used extensively by lenders to determine how much debt can be supported by project cash flows. The minimum DSCR required by lenders varies with each type of project. Historically, DSCR for toll roads have been around 1.4, and for airports and ports around 1.2. These levels have risen in the wake of the crisis in emerging markets, so that coverage ratios of 1.5 to 2.0 times debt service are not uncommon. Since transport project revenues typically rise over time, lenders will look at both a minimum and an average DSCR.

The Loan Life Cover Ratio (LLCR) is used to determine the cash flow available over the term of the debt relative to the amount of debt outstanding. It is defined as:

$$LLCR = \frac{(\text{Present value of cash flow before debt service})}{(\text{Present value of debt service costs})}$$

The discount rate used is the total interest rate applicable to the debt. The goal is to have the LLCR to be sufficiently greater than 1.0 under a full range of sensitivity analyses.

While the DSCR and the LLCR provide lenders with an initial guide as to the level of debt that a project might sustain, they also are used on an ongoing basis. They can be used to vary the interest margin on project loans. For example, a project with a low initial DSCR or LLCR may have its interest spread reduced as these ratios improve over the life of the project. Both ratios also are used to set minimum requirements before distributions may be made to equity holders. Moreover, if DSCR or LLCR decline from expectations, lenders usually require that equity investors leave funds in the project until acceptable ratio levels are restored. In extreme cases, senior debt holders may require repayment if prespecified DSCR and LLCR are not met, even if interest and principal payments are being made.

We have constructed a simple model to evaluate the effects of changing risk premiums and guarantees on the cost of capital. Table 2 provides one estimate of how costs of capital have changed for a typical transport infrastructure project.

Table 2 Effects of Increased Risk on Cost of Capital

	FROM:	TO:
Risk-free rate	6.00%	6.00%
Debt risk premium	5.00%	6.00%
Project risk premium	1.00%	2.00%
Country risk premium	2.00%	4.00%
Regulatory risk premium-debt	1.50%	3.00%
Regulatory risk premium-equity	1.50%	3.00%
Equity Risk premium	5.50%	8.00%
Asset beta	0.75	0.75
Debt beta	0.00	0.00
Equity beta	1.88	1.50
Debt as % Capital	60.00%	50.00%
Equity as % Capital	40.00%	50.00%
Marginal tax rate	30.00%	30.00%
Cost of Debt (pre-tax)	16.50%	21.00%
Cost of Debt (after-tax)	11.55%	14.70%
Cost of Equity	20.81%	27.00%
Weighted Average Cost of Capital (pre-tax)	18.23%	24.00%
Weighted Average Cost of Capital (after-tax)	15.26%	20.85%

Source: Author estimates.

The table reflects the higher risk factors for country and currency risks, as well as increases in risk premiums required by investors for more uncertainty about transport infrastructure traffic levels and revenue generation capabilities. Regulatory risk premiums have risen as a result of being unsure whether pricing increases and adjustments for exchange rates and inflation will be forthcoming in a timely manner. The higher equity percentage also is shown. Overall, the events since 1997 are estimated (in a general sectoral sense) to have caused the cost of debt to rise to as much as 15 percent (after-tax) while costs of equity may be as high as 27 percent. Overall, this leads to a weighted average cost of capital of 24 percent pre-tax, 21 percent after-tax. In conversations with investment and commercial bankers, common rules of thumb are that transport infrastructure projects in 1999 might require 30 percent equity returns, with costs of capital in the 20 percent to 22 percent range. These notions are broadly consistent with the above crude estimates.²¹ Thus, recent financial market conditions might have pushed up all-in financing costs by as 5 percent or more. We also can place this increase in monetary terms. Suppose we have a \$100 million dollar project with a 25 year life. An increase in the cost of capital from 15 percent to 20 percent would require *additional* payments to investors of just under \$5 million per year.

²¹ Of course, all of these will vary by project.

The Effect of Public Participation on the Cost of Capital in Project Finance: Guarantees versus Equity Contributions – or Both?

The increasingly difficult financial environment has caused transport project managers to seek ways of mitigating or buying down these risks, so as to reduce the cost of capital for the project and thus enhance its viability. To see this, it is useful to work through a hypothetical example of how government participation affect the viability of project finance.

One mechanism would be for the government to participate in the project investment on an equity basis. Not too long ago, the effect of this might have been to allow a higher percentage of debt finance. Unfortunately, government investment contributions are not what they used to be! But with the withdrawal of many previous sources of equity, a direct investment by the government is now likely to serve as a supplement to construction company equity, so that the aggregate amount is sufficient to reach the 60 percent debt/40 percent equity standards that are now in place.

How much public sector equity investment might be required? At a minimum, one might expect that all of the additional equity required in the capital structure might need to come from government. If project structures shift from 70/30 to 60/40, this amount might be a minimum of ten percent. For a project that requires a 50/50 structure, government might be asked to contribute as much as 20 percent. (The “old” structures of 70/30 were done in the private equity market, so we might assume all incremental equity would need to come from the public sector.) In monetary terms, this represents \$10 to \$20 million on a \$100 million project.

A few other considerations are relevant to government direct investment:

1. It allows the government to participate in the “upside” if the project turns out to perform well in the long run.
2. It creates incentives for the government to manage regulatory affairs in a timely manner, and less likely to adopt price constraints or limit price adjustments for political reasons. Thus, it may serve to reduce regulatory risks.
3. The participation of the government in the project may make it easier to re-finance when the initial tranche of debt becomes due in 5 to 10 years. In fact, such participation may make slightly longer initial maturities feasible.
4. A lower project cost of capital may result *if* the government requires a lower rate of return for its equity investment relative to private equity investors. However, since these funds are being used for the same project, I would argue that such differential required rates of return are inappropriate.

Overall, then, if the government were to participate in the equity investment, we might expect the regulatory risk premium to fall by 1 percent, and the project risk premium to fall by 1 percent. If these estimates are correct, the overall cost of capital would fall from the 21 percent shown in Table 1 to just over 19 percent. This 2 percent reduction in the cost of capital translates to just over \$2 million per year on a 25-year project. While this may make the project more feasible, it would not provide the government with the requisite equity returns. The real value to government investment would be if it allowed for both a higher share of debt and a lower required return on private equity, but this does not appear to be the case in current capital market conditions. Rather, it serves to “buy down” project size to make it more attractive to private capital.

An alternative approach is for the government to consider providing guarantees. In general, these could take two forms. The first would be to guarantee project volumes or revenues, with appropriate adjustments for inflation and exchange rate factors. The alternative is to guarantee the debt service (both principal and interest, as well as possibly a guarantee of debt refinancing at maturity). These two alternatives are quite different in character and in cost to the government.

Guaranteeing a minimum level of revenues serves to reduce risks to both equity and debt investors, while debt guarantees serve primarily to reduce borrowing costs. (If project revenues are insufficient to cover debt service, then the equity holders would receive no return during that time period.) Debt guarantees may serve to increase the relative amount of debt that the private sector would provide, so that the size of the equity investment might be correspondingly lowered.

The cost to the government of revenue guarantees therefore should be significantly higher than debt guarantees. To see this, we might consider a typical toll road project in which debt service expense is about 2/3 of net cash flows in the early years. This means that you would need a 1/3 shortfall in revenues before the debt guarantee would activate. On a \$150 million dollar toll road such as Road 5 in Peru, a 50 percent revenue shortfall might represent guarantee "makeup" payments of approximately \$3 million per year.

By contrast, suppose the project generates gross revenues of about \$30 million per year, with net revenues of \$21 million before financing costs. If this level was guaranteed, a 1/3 shortfall would require government payments of \$7 million.

To see what these effects might look like over time, I estimated the cost to the government of a \$150 million dollar toll road project under the following assumptions:

Table 3: Hypothetical Project Cash Flow Assumptions

Total Initial Investment	\$150,000,000
Total Government Investment	\$0
Total Private Investment	\$150,000,000
Year 0 Percentage Initial Investment	50%
Year 1 Percentage Initial Investment	50%
Concession life (years)	30
Percentage Debt Financing	60.00%
Cost of Debt (pre-tax)	16.00%
Cost of Equity	29.00%
Cost of Capital	21.20%
Year 1 Cash Flow	\$30,000,000
Inflation	5.0%
Real Growth Rate	3.0%
Operating & Maintenance cost percentage	30.0%

Suppose that initial revenues were lower than forecast, but then grew off of this smaller base. Also suppose that the government had guaranteed debt service on this structure. If initial revenues were half of forecast, the government would then have to provide supplemental financial support for 5 years, with a initial payment of just under \$4 million in the first year of

operation and with a total present value of payments of \$7 million (at a 21 percent discount rate). On an undiscounted basis, the total supplemental payments are estimated at just over \$10 million.

In contrast, if the net cash flow stream is guaranteed to investors, a 50 percent initial shortfall would require government payments every year, with a net present value of \$78 million for this liability. Of course, such guarantees could be structured in many ways – such as guaranteeing a percentage of the base case forecast, or a minimum monetary amount per year. (Guaranteeing a specific dollar amount is similar to providing a debt service guarantee.) In general, though, with a 60 percent debt structure, revenue shortfalls would have to be about 1/3 for debt service guarantees to be activated.

Overall, the changed financial environment has implications for designing government participation in infrastructure concessions. Rather than direct investment being a substitute for guarantees, it now serves to replace portfolio sources of equity. On the other hand, guarantees are still helpful in attracting debt capital on better terms. However, the level of revenue guarantees required to generate the much-higher expected equity returns is likely to be extremely costly to the government. Given this environment, a composite approach of debt guarantees and supplemental government investment on the equity side may provide the least-cost approach. This could be implemented by offering debt service guarantees and then asking prospective bidders to bid the minimum government investment required.²²

The Future of Project Finance in Transport

Recent developments in emerging financial markets have dramatically changed the appetite for and terms of transport infrastructure projects. The effects of defaults in Asia and Russia, and the devaluations in Asia, Russia, and Brazil, have resulted in dramatic increases in political and currency/exchange risk premia.²³ Given the large needs for sovereign debt financing, infrastructure project finance will be seeking guarantees at the same time governments are issuing primary securities. Large portfolio outflows in emerging market funds mean that the sources of both equity and debt capital that became available in the mid-1990s are drying up for all but the most creditworthy projects.

Moreover, any real economic effects from these financial events have particular consequences for the transport sector. Since transport is a derived demand, any decline in real economic activity will be quickly felt in traffic levels and revenues. These effects vary by sector, especially over the medium to longer term. Currency devaluations that help spur exports may generate higher volumes for seaports and air cargo activity.

By contrast, declines in real economic activity could make matters especially difficult for toll roads. Auto ownership rates are very sensitive to taxes and tariffs, both of which are likely to come under pressure for budgetary reasons.²⁴ In addition, trip generation is highly income sensitive. Declines in economic activity tend to have large effects on auto traffic on toll roads, as drivers shift to free alternatives and also reduce the number of trips taken.

²² This approach was considered by Peru's Special Committee on Toll Roads in December 1998.

²³ Oxford Analytica (December 1998) reports that spreads for sovereign debt over ten year US Treasuries reached 900-1400 basis points in September before abating prior to Brazil devaluation in January 1999.

²⁴ The IMF is forecasting large regional current account deficits for Latin America, which increase pressures to reduce import volumes through tariffs and taxes.

What does all this mean for project finance in transport?

1. Risks have increased.

Premia for regulatory, political, and currency risk all have risen. Country risk premiums in emerging markets, which by early 1997 had fallen to 3 percent to 5 percent above comparable maturity U.S. Treasury securities, have risen to spreads of 7 percent to 10 percent or more. Since these factors influence the expectations about economic activity, infrastructure investments that are driven by future expected growth will be cynically received by financial markets.

2. Higher costs of debt finance.

Conditions of shrinking reserves, potential devaluations, and fiscal difficulties indicate that sovereign debt spreads will continue to be high. Infrastructure projects that have significant commercial risk will face ever higher interest rates, with debt premia for political, currency, regulatory, and sectoral risks. Depending on the particular project, rates of LIBOR plus 6 to 10 percent should not be unexpected and thus should be incorporated into simulation models. In addition, widely used performance indicators such as Debt Service Cover Ratios have been adjusted, so that previous standards such as coverage of 1.5 times interest payments now are commonly 2.0 times or even higher.

Future conditions in financial markets may even be worse in the short-term. All of the above risk factors have been built upon risk-free US Treasury interest rates that are extremely low by historical standards, especially in the medium and long-term yields. Should expected inflation or real rates rise in the United States, the baseline for all of the above adjustments would move up accordingly. Moreover, any such increase in US interest rates would probably have a negative effect on US equity markets and those worldwide.

3. Available tenor of debt instruments has shortened.

Inflation and stability concerns have shortened many lenders' horizons to 5 to 7 years, compared to 8 to 10 years in recent years. This is a major problem for many infrastructure projects. Even with construction grace periods, many projects take 3 to 5 years to reach volumes that are self-supporting. These shorter tenors would require balloon refinancing take place before projects have reached enough stability in demand patterns.

4. Higher levels of equity are required for projects.

Projects that were being structured with 70 percent debt, 30 percent equity are now being discussed at a minimum of 60 percent debt, 40 percent equity. In fact, recent discussions with investment bankers indicate that governments should not be surprised to see lenders unwilling to finance more than 50 percent of many projects.

5. Sources and availability of equity finance have changed.

The rapid outflows from emerging market funds and developing infrastructure funds have reduced the ability of sponsors to tap them as equity sources. As a result, infrastructure projects have tried (once again) to look primarily to construction and engineering companies as sources of equity. However, the incentive for these parties was to earn enough profits on the construction activity to justify the upfront equity

investment required. When projects were being financed with 70 percent debt, sharing in the 30 percent equity component could be justified, especially when in most cases construction companies put in about half the equity. However, with 40 percent to 50 percent equity required, construction profits are not adequate to earn a minimally required return. In fact, the higher required rates of return on debt mean that even if the old capital structure mix could be maintained, construction company equity holders will now require an ongoing revenue stream to make such projects meet hurdle rates.

In short, the drying up of alternative sources of equity, combined with higher required equity finance shares, means that substitution of construction equity for portfolio equity will not suffice. As a result, there will be increasing pressure for governments to make become involved as equity holders in these projects.

6. Project finance efforts in transport have shifted from new projects to the privatization, rehabilitation, and expansion of existing facilities.

The established track records of many facilities lower perceived risks and also provide a revenue stream from the outset to cover capacity additions. One variant of this trend is that efforts to bundle transport projects into “packages” for both revenue diversification and to obtain cash flows from a portfolio to fund specific investments within the package of facilities. Whether these efforts will be successful remains unclear – some package proposals have been successful in early stages, such as Mexico’s airport concessions. However, the longer-term consequences of these cross-subsidy structures remain uncertain.

7. The emergence of a “superclass” of sponsors, bankers, and investors.

In transport, just as in other public utilities, a “superclass” of about fifteen to twenty project players has emerged. This group is characterized by large size and large capacity to invest; (relatively) low cost of capital with deep access to financial markets; sophisticated development skills; and strong financial support from their parent companies. Membership in this group varies by sector; for example, airport strategic investors; rail investors; transport infrastructure investment banks. This is an increasingly multinational club. While local investors and others may participate in specific niches, these major organizations increasingly have come to define the acceptable standards and de facto practices in transport project finance. This status is evident in their global presence and repeated successes in winning both competitive and noncompetitive mandates.

8. Will experience turn into wisdom?

Oscar Wilde wrote, “Experience is the name everyone gives to their mistakes.” In project finance, much experience has been gained in the past decade. Many of the lessons were there all along – sound project economics, conservative financial structure, comprehensive sensitivity analysis; the effects of macroeconomic factors; the need for proper incentives and sound institutional and regulatory arrangements. Many of the project finance deals in the 1990s should not have been done. The reaction to these failures was sharp and has persisted. As emerging markets recover and project finance activity resumes, the need is to take advantage of new roles, new instruments and acquired knowledge to build more sustainable project finance.

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